Computer Vision, Graphics, and Image Processing

EDITORS
Linda G. Shapiro
Norman Badler
Herbert Freeman
Thomas S. Huang
Azriel Rosenfeld

AN INTERNATIONAL JOURNAL

VOLUME 22, 1983

ACADEMIC PRESS
A Subsidiary of Harcourt Brace Jovanovich, Publishers
New York London Paris San Diego
San Francisco São Paulo Sydney Tokyo Toronto

Copyright © 1983 by Academic Press, Inc.
All rights reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (21 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1983 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0734-189X/83 $3.00

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 22

NUMBER 1, APRIL 1983

GUEST EDITORIAL iii

ELLEN C. HILDRETH. The Detection of Intensity Changes by Computer and Biological Vision Systems 1

ROBERT M. HARALICK. Ridges and Valleys on Digital Images 28

W. E. L. GRIMSON. An Implementation of a Computational Theory of Visual Surface Interpolation 39

MICHAEL BRADY AND BERTHOLD K. P. HORN. Rotationally Symmetric Operators for Surface Interpolation 70

DANA H. BALLARD AND O. A. KIMBALL. Rigid Body Motion from Depth and Optical Flow 95

DARYL T. LAWTON. Processing Translational Motion Sequences 116

STEVEN A. SHAFER AND TAKEO KANADE. Using Shadows in Finding Surface Orientations 145

H. C. LEE AND K. S. FU. 3-D Shape from Contour and Selective Confirmation 177

J. R. ULLMANN. An Investigation of Occlusion in One Dimension 194

ABSTRACTS OF PAPERS ACCEPTED FOR PUBLICATION 204

NUMBER 2, MAY 1983

D. T. LEE. Visibility of a Simple Polygon 207

RAMON F. SARRAGA. Algebraic Methods for Intersections of Quadric Surfaces in GMSOLID 222

K. PRAZDNY. On the Information in Optical Flows 239

NOTES

JOHN M. EINBU. Nonlinear Reduction of Data 260

ZENON KULPA. More about Areas and Perimeters of Quantized Objects 268

SEYMOUR SHLIEN. Segmentation of Digital Curves Using Linguistic Techniques 277

RONALD LUMIA, LINDA SHAPIRO, AND OSCAR ZUNIGA. A New Connected Components Algorithm for Virtual Memory Computers 287

V. CANTONI AND S. LEVIALDI. Matching the Task to an Image Processing Architecture 301

ABSTRACTS OF PAPERS ACCEPTED FOR PUBLICATION 310

NUMBER 3, JUNE 1983

CHARLES W. THERRIEN. An Estimation-Theoretic Approach to Terrain Image Segmentation 313

W. RANDOLPH FRANKLIN. Rays—New Representation for Polygons and Polyhedra 327

SURVEY

AZRIEL ROSENFELD. Picture Processing: 1982 339

NOTES

ROBERT M. HARALICK. An Interpretation for Probabilistic Relaxation 388

AMAR MITICHE AND J. K. AGGARWAL. Contour Registration by Shape-Specific Points for Shape Matching 396

CORRECTION

JOHN A. STULLER AND CLARE D. MCGILLEM. Correction of a Statement in *Digital Picture Processing* 409

BOOKS RECEIVED FOR REVIEW 410

ABSTRACTS OF PAPERS ACCEPTED FOR PUBLICATION 412

AUTHOR INDEX FOR VOLUME 22 413